IBS NEWSLETTER

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#58/59-2 November 1, 1958

System Commences Master Handbook Preparation

Publication of the I.B.S. Master Handbook has begun, Joe Coons, head of the project, reports. A master index covering the ten basic sections and hundred sub-sections has been issued to staff members who will write the articles.

The undertaking of the massive project was authorized by the System Board of Directors at the Storrs meeting in July. Coons expects to complete publication and mailing of the basic book by February 15th. The book will be in loose-leaf form so that new articles and revisions of old articles can be added from time to time throughout the academic year.

The Master Handbook will include ten basic sections, numbered 00.00 through 90.00, giving the book a tremendous expansion potential.

"The whole idea," says Coons, who originated the idea, "will be to provide a handbook that is a composite of every service of the System, as well as articles of interest written by any interested individual, that can be easily kept up to date."

No charge will be made for the Handbook beyond membership fees, but, should a station lose the book or fail to keep it up to date, there will be a charge of ten dollars upon the Handbook's recall.

The ten basic sections will be entitled, Station Engineering, Planning, Programming, Business Affairs, Law, Records, Publications, Regions, etc.

Anyone with ideas for articles should contact Regions Coordinator Joseph D. Coons at Station WRUC, Union College, Schenectady 8, New York.

FOR STATION EXECUTIVES

F.C.C. Actions

The Federal Communications Commission has adopted a composite week for 1958 Program Log Analyses. These analyses are required to be submitted by all licensees whose licenses expire in 1959, the Commission's release dated September 18, 1958, stated.

Monday	-	January	20, 1958
Tuesday	-	March	18, 1958
Wednesday	-	April	9, 1958
Thursday	-	May	15, 1958
Friday	-	July	25, 1958
Saturday	-	September	13, 1958
Sunday	-	November	17, 1958.

The Commission granted a license to the Board of School Commissioners of the City of Indianapolis (Indiana) to cover an increase in ERP of Station WIAN to 890 watts.

The Goshen (Indiana) College Broadcasting Corp. was granted a license covering a non-commercial educational station on 91.9 mcs. October 2.

On the same date, the Commission granted WKCR, Columbia University, the right to up its ERP to 1.2 kilowatts and HAAT to 460 feet.

The Commission has accepted the application for construction permit of Hofstra College, Hempstead, New York, for a 10 watt station on 88.7 mcs.

In compliance with section 309(b) of the Communications Act of 1934 as amended, the Commission directed a letter to WHRB-FM, Harvard College, and WKOX, Inc., Framingham, Massachusetts, stating the examination of the two stations' applications for channels 288 and 289 respectively revealed them to be mutually exclusive. WHRB-FM asks for 796 watts with a HAAT of 42.3 feet; WKOX, Inc., asks for 15.71 kw with HAAT of 172 feet. In a letter to the Commission dated September 30, WKOX stated that it was ready and eager to enter into a comparative hearing. The Harvard Network replied that, as a Class A station, it has no alternative to channel 288, while WKOX, Inc., applying for a Class B station, has a more satisfactory alternative in channel 300. Observers expect the two applications to be designated for hearing within two weeks.

An incomplete report has reached I.B.S. to the effect that Station KZSU, Stanford University, was closed in August by the University administration because of violation of FCC Regulations and certain infringements of University regulations. The University is reported to be studying FM as a possible alternative.

I.B.S. last month came to the defense of the call letters of a Southern carrier current station. The call, registered with the F.C.C. some years ago by I.B.S.and currently in use, was requested by a large Midwestern university for its AM outlet. I.B.S. Vice President Abraham recommended application for several available alternative calls.

REGION AND STATION NEWS

Coons Dispatches Memos: Regions Coordinator Joseph D. Coons has directed memoranda to all Regional Directors requesting that they survey their stations for suggestions looking toward improvement of the I.B.S. regional-level organization. He is interested in hearing from member stations as to possible improvements in I.B.S. regional services.

In other action, he appointed George Ward to be temporary Director of the Empire Region until an election can be held, probably early this month. Ward, experienced in writing through work on collegiate publications, is assisting Coons in preparation of the I.B.S. Master Handbook.

Southern Region Yearbook Planned: Director Jim Ritchie reports that work on the Southern Region Yearbook continues. Material has already been received from WWOO, Western Carolina College. Information regarding the Yearbook will be sent to the newer stations in the Region shortly.

Empire Region Bulletin Anniversary: The Empire Region, regional bulletin, enters its third year of publication. Featured are announcements of tape exchanges available. The bulletin seeks to increase the rate of program circulation within the Empire Region, which, if achieved, will go a long way toward bringing regional stations closer together, acting director George Ward states.

WBRU Staffer Joins I.B.S.: Former WBRU, Brown University, Program Director, John C. Wolff, Jr., joins the I.B.S. Program Department this month. He will handle special assignments in this area.

WYBC, WYBC-A, WYBC-FM Joins I.B.S.: The Yale Broadcasting Company, Inc., has applied for full membership in I.B.S. The station was granted Conditional Status on October 11. Charles D. Ellis is Chairman of the Board; Paul Horne, Business Manager; and Philip Liberman, Program Director. WYBC is represented nationally by the Ivy Network Corporation.

WHUS Names Faculty Advisor: Richard Crompton, I.B.S. Treasurer and member of the UConn faculty, has been named Faculty Advisor of the University station, WHUS (FM.) He is author of an article in the Engineering Section on Carrier Current translators.

WMWC Off Air: Confirmation has been received of reports that the Mary Washington station is off the air and is "presenting its programs from campus through a local commercial radio station."

WMSU, Mississippi Southern: WMSU has resumed active status in I.B.S. after being given a waiver to designate a national representative other than the System's.

WGTB, Georgetown University: WGTB has been granted variance from the Business Code to designate CRC as national rep.

WESU Asks Time: According to a clipping from the Wesleyan student newspaper, WESU recently asked the student Senate to grant it an extension in time and a minimum amount of money to continue its work in getting the station on a campus-wide basis.

Last year, accordingtto Michael Rosen, '60, chairman, WESU was guaranteed $1425 by the C.B. Senate provided that it would have campus-wide reception by October 1, 1958.

Rosen stated that the new Board has had just three working months in which to correct the "unfortunate situation" which the present Board found upon taking office in March.

Dr. Karl S. Van Dyke of the Wesleyan Physic department has designed a system employing, apparently, audio feeds to campus transmitters. Rosen asked for $300 and a month additionally to put the system into operation.

The campus newspaper noted that the freshman class has exhibited an unusual interest in the station. Out of the fifty freshmen who applied to the station, thirty-five have been added to the staff. The newspaper claimed WESU as the second oldest college radio station.

WMUB Serves Southwestern Ohio: 1957-58 was a year of transition for the Miami University Broadcasting Service. Old quarters were abandoned and a new FM-TV tower erected. Due to the move, WRMU, the carrier current station, discontinued operations during the spring semester. A monthly lithographed program bulletin was issued for WMUB.

In December, 1957, the music critic of the Cincinnati Enquirer, Arthur Darack, attacked Cincinnati radio stations for failing to provide better musical offerings. The ensuing clamor resulted in an offer by the Enquirier to list CM programs broadcast by WMUB.

Regional Directors Listed: As of November 1st, I.B.S. Regional Directors are:

New England Region, Carrington H. Greenidge, WHRB, 16 Dunster Street, Cambridge 38, Massachusetts;

Empire Region, George Ward, WRUC, Union College, Schenectady 8, New York;

Middle Atlantic Region, John D. Garvick, WWFM, Franklin and Marshall College, Lancaster, Pennsylvania;

Capital Region, directorship temporarily vacant;

Southern Region, James C. Ritchie, WETS, East Tennessee State College, Johnson City, Tennessee;

Great Lakes Region, Charles Dugan, WRMU, Maimi University, Oxford, Ohio;

Midwest Region, Eugene Schnierer, WRSE, Elmhurst College, Elmhurst, Illinois;

North Central Region, directorship temporarily vacant;

Southwest Region, directorship temporarily vacant;

Western Region, Bayford D. Butler, KZSU, Stanford University, Stanford, California.

PROGRAMMING

Script Library Sees Revival: The I.B.S. Script Library, housed at Miami University, has mailed out more scripts during the past few months than at the same time the previous year. Dr. Stephen C. Hathaway, librarian, attributes this to college broadcasters following their commercial counterparts in swinging away from the news-music-sports programing formula.

The I.B.S. Script Library is varied and comprehensive. It includes over 300 scripts from serious drama to light comedy, which have been made available to System stations by the authors who have donated the performance rights royalty free. Permission has been granted to use these scripts for sustaining, non-commercial production only. Arrangements for commercial performance require special permission from the author, but usually permission is given to the individual station producing the program.

The library also includes many scripts written by individual students and workshop groups. New contributions are urgently requested. Address Dr. Stephen C. Hathaway, Miami University, Oxford, Ohio.

Program Exchange Easy: Rev. Francis J. Heyden, System program manager, emphasizes the ease with which member stations may make programs available for circulation to other member stations. The master tape is sent to his Georgetown University studios, Washington 7, D.C., where it is immediately dubbed and the master tape returned to the originating station.

Thereafter, member stations may request specific programs or programs on specified topics. These will be dubbed from the tape library and tapes sent to the requesting station. It may either return them monthly after broadcast or reimburse the I.B.S. library at the rate of $1.46 per 7" reel of first quality tape.

I.B.S. stations are able to draw on the vast historical tape collection housed at G.U. For further information, contact Father Heyden.

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Program Manager, Fr. Francis J. Heyden, Georgetown University, Washington 7, D.C.

P.R. Manager, Dr. S.C. Hathaway, Miami U., Oxford, Ohio.

ENGINEERING

A Low-Power Campus Station Translator: By Richard H. Crompton, Instructor, and Kenneth W. Fitts, Research Assistant, Department of Electrical Engineering, University of Connecticut.

About a year ago officers of WHUS, 10 watt educational FM station on the campus of the University of Connecticut, called upon the authors and recited the familiar story of past inability to channel carrier-current AM signals to the resident students of the University. The results of past failures had been the establishment of the 10watt educational FM outlet. This outlet served as a certain training ground, etc., but failed to achieve a principal goal of coverage of the student body. Thus, the desire to go forward with another attempt at carrier current was foremost.

The dispersement of the resident students over the large area of the Storrs campus presented problems of prohibitive costs of maintaining leased audio lines to carry signal to satellite transmitters at many locations. The station staff had, therefore, purchased a number of small and inexpensive Granco FM receivers (an AC-DC powered device now on the commercial market) which they proposed to utilize as remote pick-up devices for the FM signal. The FM signal would be demodulated by the Granco FM receiver and used to modulate a small carrier-current transmitter. A description of this set of remotely located equipment is of interest to many present or potential carrier-current users. The point should be made, however, that demodulation of the FM signal of an educational station in this manner does not permit the use of commercial advertising over the carrier-current outlet. This may be prohibitive if the station requires the revenue which can be gained through advertising on the AM outlet.

Modifications of the FM Receiver: The Granco FM receiver incorporated the typical AC-DC power supply system and audio stages equally typical of this type of competitive equipment. Both of these systems were bodily removed from the chassis, together with the FM loop antenna and the speaker. The large cut in the chassis for the speaker was filled with a sheet of copper which was cut to mount a phase inverter stage and push-pull 6AQ5 pentode operating as Class A modulators. A modulation transformer (Stancor) was also fitted onto the chassis in the space vacated by the rectifier.

Transmitter: The staff of WHUS desired a simple, stable and easily constructed transmitter, since a number of units would have to be built after the first model. Our philosophy and results follow.

Oscillator: The arguments for use of a crystal controlled oscillator are irrefutable. Briefly, these include: 1) Desire to minimize heterodyne note of audio frequency due to beats with adjacent channel commercial stations; 2) Freedom from periodic frequency measurement and readjustments; 3)

Compliance with the F.C.C.requirements,especially in view of expected new rulemaking on the part of the Commission in the area of campus radio regulation. A temperature compensated crystal was, however, considered an unnecessary luzury at a prohibitive cost. Results indicate that this assumption was well grounded.

Having determined to utilize a crystal for frequency control, choice of oscillator circuit was next. One which immediately suggested itself was the Colpitts circuit, which requires no troublesome tapped coils, etc. Such a circuit was built using one of the sections of a miniature 12AT7 dual triode.[1]

Buffer Amplifier: The wide variations in load presented the transmitter by a power line might easily cause frequency pulling of an oscillator unless a buffer stage was incorporated between the oscillator and the final amplifier. The remaining triode section of the 12AT7 quite fortunately proved a most satisfactory Buffer through oscillator frequencies up to one megacycle without neutralization circuits. Needless-to-say, care must be taken in construction to reduce plate to grid freedback lest the buffer go into oscillation and re quire the addition of neutralization schemes. In the model constructed, no shielding was installed across the bottom of the tube socket, though such might provide an additional safety factor. A standard slug tuned video peaking coil (Meissner 19-1921) which tuned the range of 115 to 195 microhenrys was shunted with a fixed ceramic capacitor to form the buffer plate tank circuit. Use of 330 uufds provides plate circuit resonance below about 800 kcs, while 150 uufds in shunt with the peaking coil was found to resonate from 800 kcs to 1.15 mcs.

Final Amplifier Stage: A single miniature 6AQ5 pentode was operated Class B for a final amplifier. The plate voltage was shunt fed to the tube to permit use of a standard variable capacitor with grounded rotor plates and a tank circuit void of hazardous DC potentials. A standard inductance (B&W 3016 Miniductor) was used with a 200 uufd variable capacitor and enough additional shunting capacity to tune the desired range. In the WHUS case of a 690 kc carrier frequency, an additional 700 uufds was used (at 1 mc this value is 270 uufds.) Six turns of a larger diameter and coarser pitched coil (B&W 3017 Miniductor) were glued over the plate tank inductance to provide an output link.

Composite Unit: The transmitter was assembled on a 5x7 inch alumnium open end chassis and provided with jacks for metering the cathode current of each stage so as to permit easy tuning of the circuits. This chassis and that of the modified FM receiver were mounted on a larger chassis which provided 125 volts DC for the operation of the RF stages of the receiver and 250 volts DC for the modulator stages and the transmitter. The total drain of the transmitter at resonance is about 40 milliamperes.

Results: The transmitter will easily load up to a measured 2.5 watts of unmodulated carrier output into a load.

Even though a regulated supply was not used for the oscillator plate voltage, the measured frequency shift for a /̲ 50 percent change in the DC supply voltage was only about 5 cps at 1 megacycle. Voltage regulation was certainly unnecessary! No data is available concerning shift due to temperature change. This is a function of the cut of the particular crystal in use. Wide Temperature variations are likely not encountered in most applications of this equipment.

The system, when properly coupled to the power lines, provided completely satisfactory results. Numerous translator units are now used by WHUS.[2]

Work is presently underway to evolve a completely transistorized transmitter and modulator of this type to provide about 0.5 watts RF output.

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[1] "How to Design Colpitts Crystal Oscillators," H.E. Gruen, Electronics Magazine, January, 1957.

[2] A schematic of the r.f. section of one of these units appears on page 8. A picture of the entire translator appears in the <u>Newsletter</u> Photo Section.

<u>Transistor Brochure Offered:</u> Motorola, Inc., 5005 East McDowell Road, Phoenix, Arizona, offers a free group of brochures outlining transistorized circuits of interest to the engineer or student.

<u>Transistorized Console:</u> A. C. Angus described General Electric's Console Designed for the Future in the September issue of the I.R.E. Transactions on Broadcast Transmission Skystems. This was mailed free to PGBTS members.

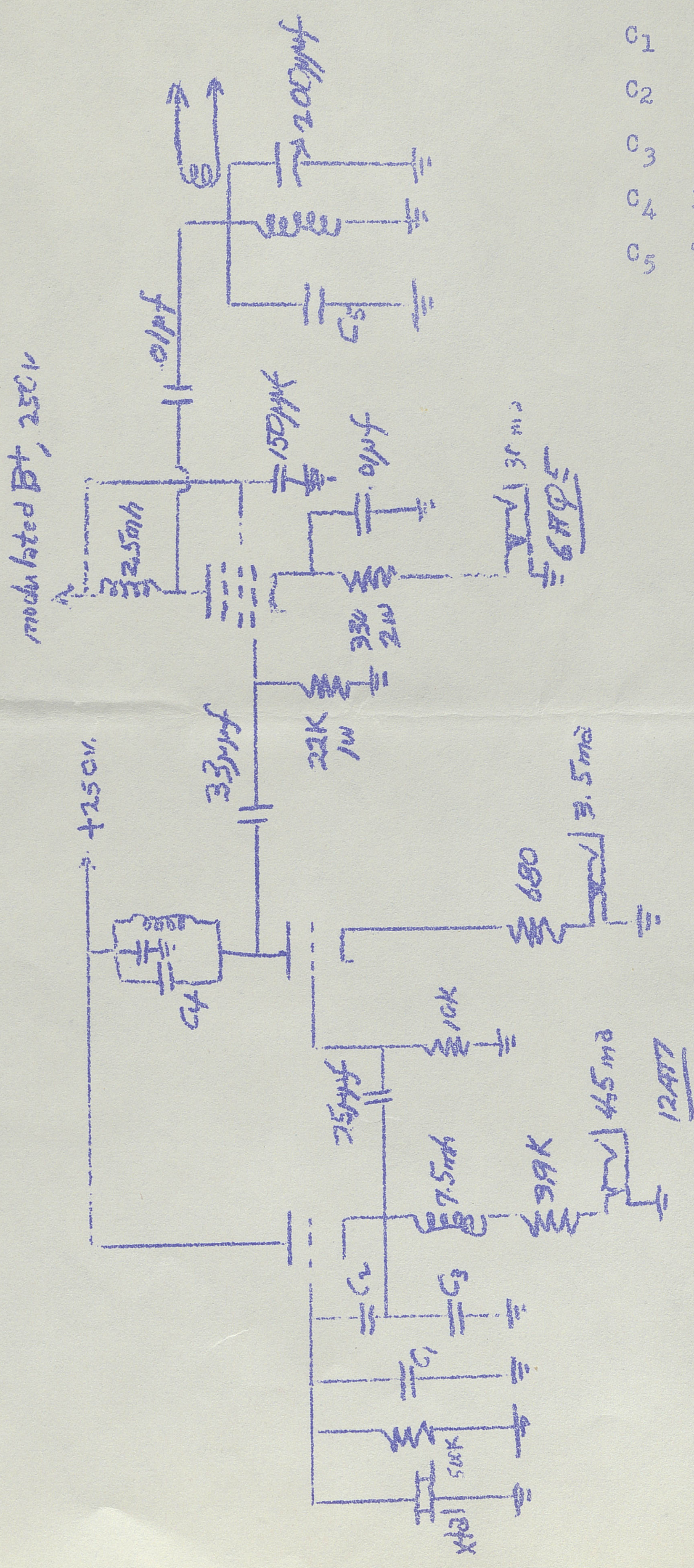
Interestingly, G.E. uses input transformers in its mike channels on the grounds that it offers an unloaded input for the microphone output; in addition, it makes possible a balanced input which is highly advantageous from a noise and hum pick-up viewpoint.

The control circuits use semi-conductors extensively. Diodes are used for click suppression across each relay coil. In addition, another diode is used for polarized control of relays by the input channel keys.

Each amplifier module is on a plug-in chassis equipped with Elco connector pins.

<u>Crosby Describes FM Stereo:</u> Murray G. Crosby, President of Crosby Laboratories, at the Eighth Annual Broadcast Symposium sponsored by the I.R.E.'s PGBTS September 26-27, described the FM multiplex stereo system now being used by WBAI, New York, and WJBR, Wilmington. It uses a 50 kc subcarrier modulated by a difference signal to 50% of the capacity of the channel. See <u>Newsletter</u>, #58/59-1.

	At 690	At 1000
C_1	25uuf	33uuf
C_2	33uuf	15uuf
C_3	50uuf	56uuf
C_4	330uuf	150uuf
C_5	700uuf	270uuf



CARRIER-CURRENT TRANSMITTER. WHUS